Case No. 6235-Fetterolf et al.

APPLICATION FOR UNITED STATES LETTERS PATENT

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

Be it known that **John F. Fetterolf**, a citizen of the United States, residing 3921 Emilridge Drive, in the County of Cumberland, State of Pennsylvania; **Marlin E. Clark**, a citizen of the United States, residing at 1310 Valley Road, in the County of York, State of Pennsylvania, and **Allen D. Smith**, a citizen of the United States, residing at 3926 Ridgeland Boulevard, in the County of Cumberland and State of Pennsylvania, have invented an **LOCOMOTIVE DRAFT GEAR ASSEMBLY AND YOKE** of which the following is a specification.

CERTIFICATE OF MAILING

I hereby certify that this patent application is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to Box Patent Application, Commissioner of Patents, Alexandria, VA 22313-1450 on July 9, 2003.

Edward J. Brosius
Type or Print Name

Signature

9 JULY 2003
Date

LOCOMOTIVE DRAFT GEAR ASSEMBLY AND YOKE

BACKGROUND OF THE INVENTION

The present invention relates to railcar coupling systems, and more particularly to draft gear assemblies used in conjunction with draft sills and couplers in locomotives.

Draft gear assemblies form the connection between the couplers at the ends of adjoining railroad freight cars and the draft sills at the ends of the freight cars. The draft sills are commonly cast or fabricated sills that are mounted at the ends of the center sills of the railcar. The draft sills have a pair of front stops and a pair of rear stops, with a draft gear pocket between the stops. The draft gear assembly is received in the draft gear pocket.

Each draft gear assembly is connected to one coupler, and couplers of adjacent rail cars are connected to form the train. The train may be one hundred cars long and drawn by one or more locomotives. Typically, there is a limited amount of slack or free movement allowed between the cars; generally there is about two inches of slack. This slack permits the rail cars limited movement toward and away from each other in response to train action and yard impact events.

Train action events include, for example: locomotive start up and acceleration; dynamic braking; differences in braking forces of adjacent cars; and gravity-induced movement of the cars as the train moves onto and away from inclines. Yard impact events include "humping" of the individual cars to build the train in the yard; in humping, a car is pushed over a hump in the track in the yard,

released and allowed to roll down the incline of the hump toward an awaiting car; during humping, the released cars can reach speeds of 4-10 mph and can severely impact the coupler of the awaiting car.

Train action events and yard impact events both subject the couplers of the cars to buff impacts, and train action events also subject the couplers of the cars to draft impacts. These impacts are transmitted from the couplers to the draft gear assemblies to the rail car body. That is, as the couplers are pulled or pushed, the movement is translated to the freight car body through the draft gear assemblies. Typical draft gear assemblies include a yoke element that is connected to the coupler through a pin or key, a coupler follower and a draft gear, as well as other elements. Generally, the coupler follower is positioned against or closely spaced from the butt end of the coupler in the draft gear pocket, within the yoke. The draft gear is positioned between the coupler follower and the rear stops of the draft sill; other elements, such as a wedge, may be interposed between the draft gear and the coupler follower.

In buff events, the butt end of the coupler moves inward against the coupler follower toward the rear stops of the draft sill. As the coupler and coupler follower are moved rearward, the shock of the movement is transferred to the draft gear. The draft gear typically absorbs and dissipates some of the energy from this shock through friction.

In draft events, slack is taken up between adjacent cars beginning at one end of the train and ending at the other end of the train. As a result of the slack being

progressively taken up, the speed differences between the railcars increases as the slack at each coupler pair is taken up, with a resultant increase in buff and draft impacts on the couplers. This slack is taken up progressively, coupler pair by coupler pair. When the slack in the coupler pair joining the last car to the train is taken up the next to the last car may be moving at a speed of 4 miles per hour. The slack in the last coupler pair is taken up very rapidly and the last two cars are subjected to a very large impact capable of damaging the lading or the car.

There is an on going review of the weight of freight car and locomotive components in an effort to maintain strength and performance, while lessening the weight of such components. One known yoke for use in a locomotive draft gear assembly is made of cast steel and weighs about 510 pounds. This shown yoke is made of Grade B steel.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide our improved, lighter weight yoke for use in a locomotive draft gear assembly.

It is another object of the present invention to provide an improved, lighter weight locomotive draft gear assembly.

In one aspect, the present invention provides a draft gear assembly for use with railway locomotives. The draft gear assembly has front and back ends and comprises a yoke, a coupler follower, and at least one resilient member. The yoke has a front wall, a back wall, a top strap extending from the back wall toward the front wall. A coupler follower is positioned adjacent the front wall of the yoke. A

resilient member is positioned between the coupler follower and another follower adjacent the back wall of the yoke. The top strap and bottom strap of the yoke are tapered to a reduced width at the back wall. The front wall of the yoke comprises top and bottom sections of reduced area due to a convex edge of each section.

In another aspect, the present invention provides a yoke for use in a railway locomotive draft gear assembly. The yoke has a back wall, a front wall, a top strap extending from the front wall to the back wall, and a bottom strap extending from the front wall to the back wall. The front wall includes two side sections and a bottom section and a top section. The top strap and bottom strap are tapered to a reduced width at the back wall. The front wall top and bottom sections are of reduced area due to a convex edge.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the drawings,

Fig. 1 is a rear perspective view of a yoke of the present invention;

Fig. 2 is a front perspective view of a yoke in accordance with the present invention;

Fig. 3 is a top view of a draft gear assembly and coupler in accordance with the present invention;

Fig. 4 is a side view of a draft gear assembly and coupler in accordance with the present invention, and

Fig. 5 is a perspective view of a follower in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to Figs. 1 and 2 of the drawings, a yoke for use in a locomotive draft gear assembly is shown generally at 10. Such yoke is typically a single casting of steel. Yoke 10 is seen to comprise an elongated top strap 12 and an elongated bottom strap 14. Rear end 16 of yoke 10 and front end 18 of yoke 10 are joined by top strap 12 and bottom strap 14.

Back wall 16 is shown as having an inner concave surface 17 adapted to abut against the complementary convex surface of the rear follower.

Front wall 18 is seen to comprise two side sections 28 that are spaced laterally and extend from top strap 12 to bottom strap 14. Front wall is further seen to comprise a top section 22, center section 26, and bottom section 24. Each of front wall top section 22, front wall center section 26 and front wall bottom section 24 are seen to have a convex edge extending from a center forward most portion back into contact with front wall side sections 28. A draft pin retainer 20 is seen to extend downwardly from front wall bottom section 24. By such a design of front wall top section 22, front wall center section 26 and front wall bottom section 24, significant weight savings are provided from the prior art locomotive draft gear yoke, which did not have such convex edges.

Bottom strap 14 is seen to include indented section 32 of reduced thickness in a center area of bottom strap 14. Top strap 12 contains a similar indented area of lessened thickness in an effort to reduce overall weight of yoke 10.

Bottom strap 14 is also seen to include a curvature 34 wherein the width of bottom strap 14 is lessened from front wall 18 toward back wall 16. A similar curved section 36 is present on top strap 12 where by top strap 12 is reduced in diameter from front wall 18 toward back wall 16. It is also seen that back wall 16 is of a width similar to the width of the reduced width sections of top strap 12 and bottom strap 14. Such width is about 8.25 inches. The reduced width of top strap 12, bottom strap 14 and back wall 16 combine to provide further weight savings in the improved design of yoke 10.

Referring now to Figs. 3 and 4 yoke 10 is shown as part of a draft gear assembly 50 wherein a coupler 63 is received within front wall 18 utilizing pivot pin 65. Coupler 63 is comprised of pivot or butt end 66, shank 64 and coupler head 68. Knuckle 70 is seen to pivot within coupler head 68. Pivot pin 65 is seen to extend through openings in front wall top section 22, center section 26, and bottom section 24. An appropriate bar device extends through openings in pivot pin retainer 20 to keep pivot pin 65 retained in the coupler draft gear assembly.

Coupler follower 52 is seen in detail in Fig. 5, and is usually a cast steel, generally rectangular structure. Coupler follower 52 includes side edge support 53 that are seen as raised structure extending from the back wall of coupler follower 52. Side edge lightener openings 59 are seen to extend through side edge supports 53 for weight savings. Coupler follower 52 includes center support 55 which is a raised, generally rectangular section extending from the back face 51 of coupler follower 52. Such raised center support adds strength to coupler follower 52.

However, for weight savings, lightener areas 57 are seen to be provided at each corner of center support 55 for weight savings. Such lightener areas amount to removal of the corner sections of center support 55.

Coupler follower 52 is seen to be inserted between top strap 12 and bottom strap 14 of yoke ten and adjacent the inner surface 19 of front wall 18. Rear follower 54 is quite similar to front follower 52 but is of a bit larger depth. Rear follower 54 is seen to have a rear face that is positioned adjacent inner surface 17 of back wall 16. Rear follower 54 is also positioned between top strap 12 and bottom strap 14. Both coupler follower 52 and rear follower 54 are usually comprised of cast steel.

Draft gear 56 is seen to be positioned between top strap 12 and bottom strap 14 of yoke 10, and is also positioned between rear wall 72 of coupler follower 52 and rear wall 74 of rear follower 54. Draft gear 56 is seen to comprise a series of plates 58, which are usually circular in cross section and metallic, usually of steel composition. Between each plate 58, elastomer pad 60 is located. As seen from Figs. 3 and 4, a series of elastomer pads 60 and plates 58 comprise draft gear 56.

In a buff situation, when lateral force is applied through coupler shank 64 and pivot end 66 laterally into draft gear assembly 50, sufficient tolerance is provided in the opening for pivot pin 65 such that coupler butt end 66 contacts the front face of coupler follower 52 and imparts a laterally compressive force against draft gear 56. Draft gear 56 accordingly acts as a cushioning device to absorb some of the buff load from the coupler. In draft, when horizontal force is applied through

coupler shank 64, such force is applied through pivot pin 65 into front wall 18 of yoke 10.